



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/595,881	05/17/2006	Kazuhiro Yamada	Q94984	8464
23373	7590	05/13/2009	EXAMINER	
SUGHRUE MION, PLLC			ETHERIDGE, EMPRESS A	
2100 PENNSYLVANIA AVENUE, N.W.				
SUITE 800			ART UNIT	PAPER NUMBER
WASHINGTON, DC 20037			1795	
			MAIL DATE	DELIVERY MODE
			05/13/2009	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/595,881	YAMADA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Empress Etheridge	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_.
- 2a) This action is **FINAL**.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-5 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_ is/are allowed.
- 6) Claim(s) 1-5 is/are rejected.
- 7) Claim(s) \_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 17 May 2006 is/are: a) accepted or b) objected to by the Examiner.
 

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____ .                                     |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>09/11/2006 and 05/17/2006</u> .                               | 6) <input type="checkbox"/> Other: ____ .                         |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Koiche et al. (JP Pub. No. 2002-240215) (“Koichi”).

Regarding claim 1, Koiche teaches a composite film (microporous composite membrane) comprising a coating layer made of a porous material (B) polyvinylidene fluoride (porous coating layer) capable of being gelatinized on at least one surface of a polyolefin fine porous film (microporous polyolefin membrane) (see abstract and paragraph [0023]) and that the porous material (B) polyvinylidene fluoride (porous coating layer) has a porous structure with a rod like edge having an opening (cylindrical penetrating pores) (see paragraph [0038]).

Regarding claim 2, Koiche teaches the pores of the porous material/polyvinylidene fluoride have an avg. pore diameter of 2.5 $\mu$ m (see table I).

Regarding claim 3, Koiche teaches a method of manufacturing a bipolar membrane/composite film (microporous composite membrane) that includes: dissolving a polymeric material polyvinylidene fluoride (porous coating layer), which is capable of being gelatinized on at least one surface of a polyolefin fine porous film (microporous polyolefin membrane) (see abstract and paragraph [0023-0026]), in N-methyl

Art Unit: 1795

pyrrolidone as a good solvent and an alcohol such as methanol as a poor solvent (see paragraphs [0026 and 0029]). Koiche teaches drying after applying the polymeric material polyvinylidene fluoride (porous coating layer) to at least one surface of the polyolefin to form the bipolar membrane/composite film (microporous composite membrane) (see paragraph [0026]), which is equivalent to applicants drying it to form a porous coating layer of the fluororesin.

Regarding claims 4 and 5, Koiche teaches the composite film (microporous composite membrane) is usable as a separator in a lithium battery (see abstract).

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamano et al. (U.S. Pat. No. 6,468,698) ("Hamano") in view of Miyamoto et al. (U.S. Pub. 2004/0202928) ("Miyamoto").

Art Unit: 1795

Regarding claim 1, Hamano teaches an adhesive resin layer 8 (microporous composite membrane) comprising polyvinylidene fluoride (porous coating layer of a gelable fluororesin) and an ionically conducting polymer compound (microporous polyolefin membrane) incorporated therein (see abstract and column 6, lines 58-65). Hamano teaches that the ionically conducting polymer compound can be polyethylene (microporous polyolefin) (see column 5, lines 14-26). Polyethylene is well known in the art as a polyolefin as evidenced by Miyamoto. Miyamoto teaches a polyolefin resin such as polyethylene used to form an insulating layer (see paragraph [0022]).

Hamano fails to explicitly teach that the coating layer has cylindrical penetrating pores or that the resin layer 8 and the polyolefin are microporous. However, it is the position of the examiner that such properties are inherent, given that both Hamano and the present application use the same materials. A reference which is silent about a claimed inventions features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. In re Robertson, 49 USPQ2d 1949 (1999).

Regarding claim 2, Hamano fails to teach the diameter of the penetrating pores of the coating layer are 0.1-50 $\mu$ m. However, it is the position of the examiner that such a property is inherent, given that both Hamano and the present application use the same material. A reference which is silent about a claimed inventions features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. In re Robertson, 49 USPQ2d 1949 (1999).

Art Unit: 1795

Regarding claims 4 and 5, Hamano teaches a lithium ion secondary battery having a separator 7 comprised of an adhesive mixture/adhesive resin layer 8 applied to both sides of a porous polypropylene sheet (see abstract; column 8, lines 58-67; and column 9, line 1).

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamano and Miyamoto, as applied to claims 1-2 and 4-5 above, and further in view of Iijima et al. (U.S. Pub. No. 2003/0108797) ("Iijima").

Regarding claim 3, Hamano teaches a method for producing a resin layer 8, (microporous composite membrane) comprising a polyvinylidene fluoride and an ionically conducting polymer therein, that is made by thoroughly stirring a mixture of polyethylene glycol, polyvinylidene fluoride and NMP (good solvent for the fluororesin). Then applying the mixture to the separator followed by drying by placing in a hot air dryer to form the laminate (see column 8, lines 58-67 and column 9, lines 1-9). Such a drying would inherently improve adhesiveness of the resin layer 8 comprising a polyvinylidene fluoride and an ionically conducting polymer therein.

Hamano fails to explicitly teach that the polyvinylidene fluoride (gelable fluororesin) is in a mixed solvent containing a poor solvent having a dipole moment of 1.8 Debye or less.

However, Iijima teaches a mixed solvent containing acetone (good solvent) as the first solvent and toluene (poor solvent) for the second solvent. Iijima teaches that with this mixture the second solvent has a boiling point higher than the first solvent and when such a relation is satisfied the evaporation of the first solvent is followed by the

Art Unit: 1795

evaporation of the second solvent so that a much higher porosity can be achieved. Therefore, it would have been obvious to one having ordinary skill in the art to combine the prior art references by substituting the mixed solvent described by Iijima for the NMP solvent used by Hamano for the benefit of increasing the amount of the liquid electrolyte to be retained because Iijima teaches that use of these components as solvent provides higher porosity (see paragraphs [0046] and [0047]). Although, Iijima does not explicitly teach the dipole moment of the toluene, it is the position of the examiner that such a property is inherent, given that both Hamano and the present application use the same material. A reference which is silent about a claimed inventions features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. In re Robertson, 49 USPQ2d 1949 (1999).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Empress Etheridge whose telephone number is (571)270-7892. The examiner can normally be reached on Monday- Friday 8:30-5:00 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sines can be reached on (571)272-1263. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1795

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/E. E./  
Examiner, Art Unit 1795

/Brian J. Sines/  
Supervisory Patent Examiner, Art Unit 1795